UNDERWATER BRIDGE INSPECTION REPORT

STRUCTURE NO. 7003

CSAH NO. 38

OVER THE

BIG FORK RIVER

DISTRICT 1 - ITASCA COUNTY

PREPARED FOR THE

MINNESOTA DEPARTMENT OF TRANSPORTATION

BY

COLLINS ENGINEERS, INC.

JOB NO. 3512

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

REPORT SUMMARY:

The substructure units inspected at Bridge No. 7003, Piers 1 through 5, were found to be in good to satisfactory condition with no significant deterioration. The timber piles were typically firm and sound with random minor checking, with more extensive checking and splitting present at two piles. There was a light to moderate accumulation of timber debris observed throughout the bridge and around all piers, especially across the upstream fascia.

INSPECTION FINDINGS:

(A) Overall, the timber piles were firm and sound with random checking typically 1/8 inch wide and 1 to 3 feet long. Two piles exhibited more extensive checking and a 1/4-inch-wide by 3-inch-deep split extending from the top of the pile to the mudline.

(B) Random 6- to 18-inch-diameter pieces of timber debris were scattered in and around all of the piers, and a light to moderate accumulation of timber debris was observed along the upstream fascia of the bridge.

(C) A 3-foot-radius by 2-foot-deep scour depression was observed at the upstream pile of Pier 2.

RECOMMENDATIONS:

(A) At this point, timber drift accumulation at the bridge is not excessive; however, it should be monitored, and if found to be progressing to an extent where excessive lateral loads may be exerted on the bridge or scour may be influenced, the drift may need to be removed at that time.

(B) Reinspect the submerged substructure units at the normal maximum recommended (NBIS) interval of five (5) years.

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

Daniel G. Stromberg

Date 6/30/2004 Registration No. 21491

Respectfully submitted,

COLLINS ENGINEERS, INC.

Daniel G. Stromberg
Registered Professional
Engineer, State of Minnesota

MINNESOTA DEPARTMENT OF TRANSPORTATION

UNDERWATER BRIDGE INSPECTION

1. BRIDGE DATA

Bridge Number: 7003

Feature Crossed: The Big Fork River

Feature Carried: CSAH NO. 38

Location: District 1 - Itasca County

Bridge Description: The bridge superstructure consists of six spans of timber deck on multiple timber stringers. The superstructure is supported by five timber pile piers and two timber pile abutments. The piers are numbered 1 through 5 starting from the west end of the bridge.

2. INSPECTION DATA

Professional Engineer Diver: Daniel G. Stromberg
State of Minnesota, P.E., No. 21491

Dive Team: Michelle D. Koerbel, Matthew J. Lengyel

Date: August 23, 2002

Weather Conditions: Sunny, ± 70^{o} F

Underwater Visibility: "5 Foot

Waterway Velocity: "0.5 f.p.s.

3. SUBSTRUCTURE INSPECTION DATA

Substructure Inspected: Piers 1 through 5.

General Shape: The piers each consist of six timber piles interconnected with timber cross bracing.

Maximum Water Depth at Substructure Inspected: Approximately 7.5 foot.

4. WATERLINE DATUM

Water Level Reference: The top of pile cap at north end of Pier 5.

Water Surface: The waterline was approximately 5.8 feet below reference.
Assumed Waterline Elevation = 94.2.

5. NBIS CODING INFORMATION (Minnesota specific codes are used for 92B and 113)

Item 60: Substructure: Code 6

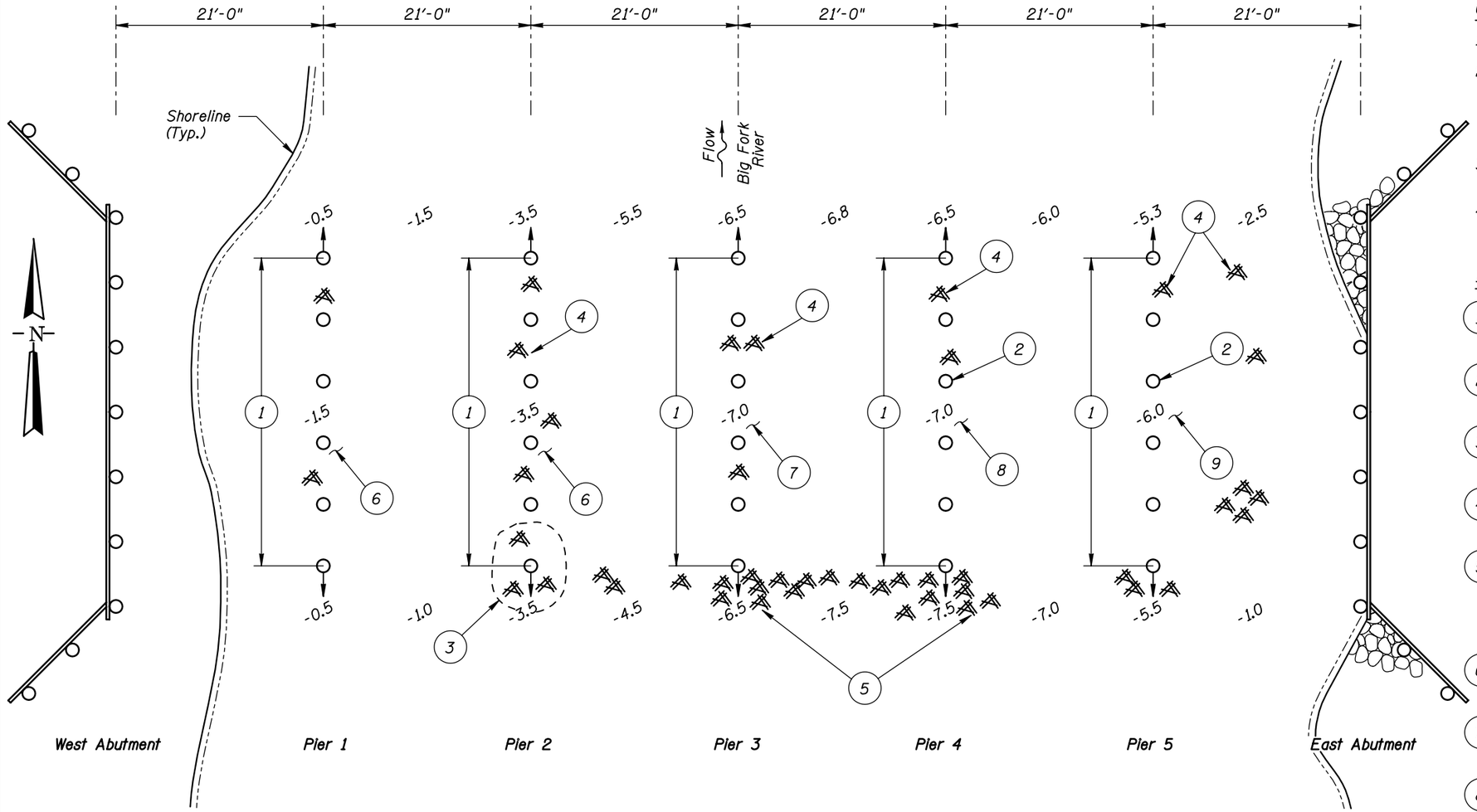
Item 61: Channel and Channel Protection: Code 7

Item 92B: Underwater Inspection: Code B/08/02

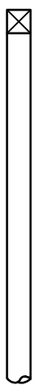
Item 113: Scour Critical Bridges: Code U/02

Bridge is scour critical because abutment or pier foundation is rated as unstable due to observed scour at bridge site.

_____ Yes ___X__No



SOUNDING PLAN



TYPICAL END VIEW OF PIERS

GENERAL NOTES:

1. Piers 1 through 5 were inspected underwater.
2. At the time of inspection on August 23, 2002, the waterline was located approximately 5.8 feet below the top of the cap at the north end of Pier 5. Since insufficiant bridge elevation information was available a reference elevation of 100.0 was assumed. Based on the assumed reference the waterline elevation was 94.2.
3. Soundings indicate the water depth at the time of inspection and are measured in feet.
4. Soundings were taken parallel to the bridge at mid point intervals between the substructure units.

INSPECTION NOTES:

(1) Overall, the timber piles were firm and sound with random checking typically 1/8-inch-wide and 1- to 3-foot-long.

(2) Pile exhibited a 1/4-inch-wide, 3-inch-deep split extending from the top of the pile to the mudline.

(3) A 3-foot-radius, 2-foot-deep scour pocket was observed at the upstream pile at Pier 2.

(4) Random 6- to 18-inch-diameter pieces of timber debris were scattered on the channel bottom throughout the pier.

(5) A moderate accumulation of timber debris was observed along the upstream fascia extending from 1 foot above the waterline to 1 foot below the waterline at Piers 3 and 4 and the span in between and from the channel bottom to the waterline at Pier 5.

(6) The channel bottom consisted of silt with probe rod penetrations ranging from 1 to 2 feet along Pier 2 to 2 to 3 feet along Pier 1.

(7) The channel bottom consisted of silty sand with a probe rod penetration of 6 inches.

(8) The channel bottom consisted of sandy gravel with 3 inches of probe rod penetration.

(9) The channel bottom consisted of sand and gravel with 1-foot-diameter cobbles with no probe rod penetration.

Legend

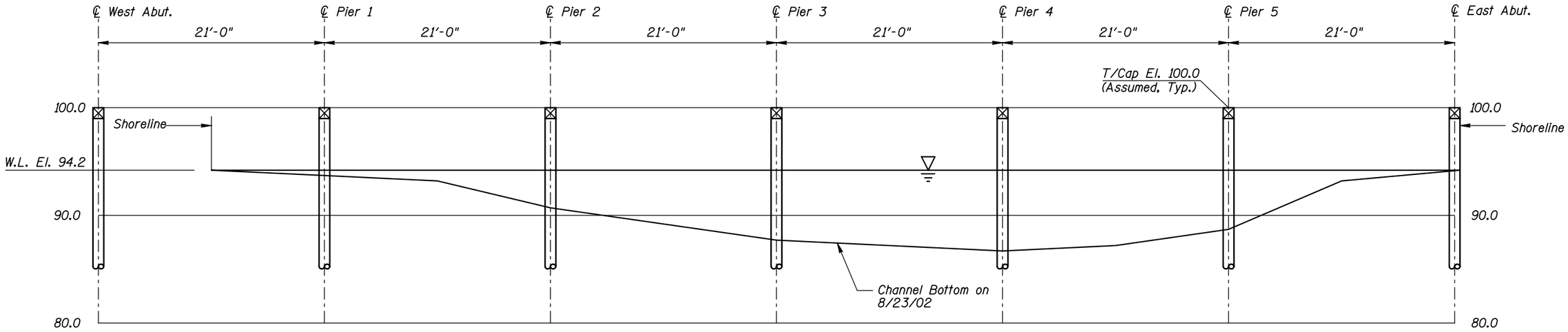
-5.2	Sounding Depth from Waterline
	Timber Pile
	Battered Timber Pile
	Timber Debris
	Riprap
	Scour Depression

MINNESOTA
DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

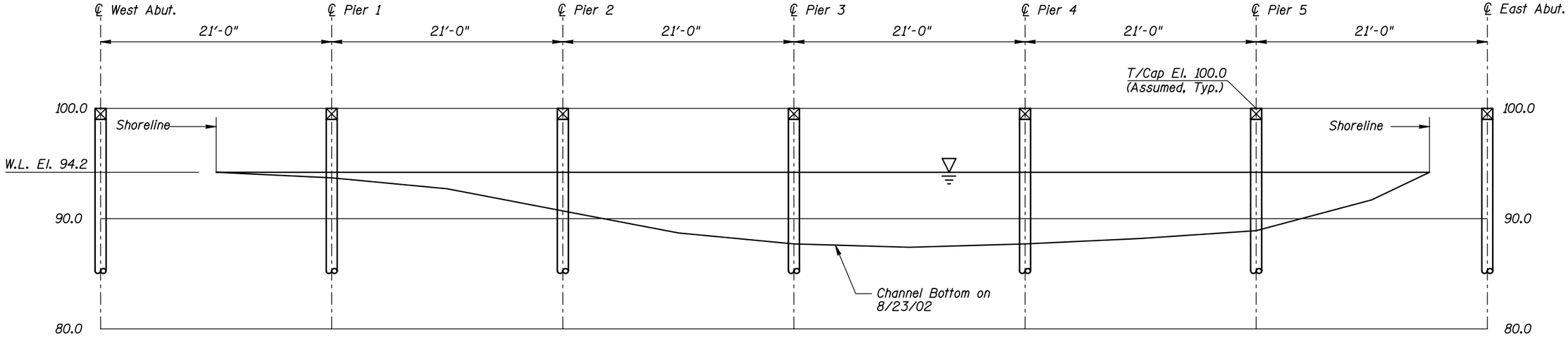
STRUCTURE NO. 7003
OVER THE BIG FORK RIVER
DISTRICT 1, ITASCA COUNTY

INSPECTION AND SOUNDING PLAN

Drawn By: PRH	COLLINS ENGINEERS, INC.	Date: AUG. 2002
Checked By: MDK	300 W. WASHINGTON, STE. 600 CHICAGO, ILLINOIS 60606 (312) 704-9300	Scale: NTS
Code: 35127003		Figure No.: 1



UPSTREAM FASCIA PROFILE



DOWNSTREAM FASCIA PROFILE

Note:

Refer to Figure 1 for General Notes.

MINNESOTA
DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

STRUCTURE NO. 7003
OVER THE MISSISSIPPI RIVER
DISTRICT I, ITASCA COUNTY

UPSTREAM AND DOWNSTREAM FASCIA PROFILES

Drawn By: PRH	**COLLINS ENGINEERS, INC.**	Date: AUG. 2002
Checked By: MDK	300 W. WASHINGTON, STE. 600 CHICAGO, ILLINOIS 60606 (312) 704-9300	Scale: 1"=10'
Code: 35127003		Figure No.: 2

Photograph 1. Overall View of the Structure, Looking Southwest.

Photograph 2. View of the Timber Debris along Upstream Fascia, Looking West.

Photograph 3. View of Pier 5, Looking West. Typical Condition and Configuration of all Piers.

MINNESOTA DEPARTMENT OF TRANSPORTATION
OFFICE OF BRIDGES AND STRUCTURES
DAILY DIVING REPORT

INSPECTORS: Collins Engineers, Inc. DATE: August 23, 2002
ON-SITE TEAM LEADER: Daniel G. Stromberg, P.E.
BRIDGE NO: 7003 WEATHER: Sunny, ± 70° F
WATERWAY CROSSED: The Big Fork River
DIVING OPERATION: X SCUBA SURFACE SUPPLIED AIR
OTHER
PERSONNEL: Michelle D. Koerbel, Matthew J. Lengyel
EQUIPMENT: Scraper, Lead Line, Sounding Pole, Probe Rod, Sounding Pole, Camera
TIME IN WATER: 2:50 P.M.
TIME OUT OF WATER: 3:40 P.M.
WATERWAY DATA: VELOCITY "0.5 f.p.s.
VISIBILITY ± 5.0 feet
DEPTH 7.5 feet maximum at Pier 4
ELEMENTS INSPECTED: Piers 1 through 5
REMARKS: Overall, the submerged timber of Piers 1 through 5 was in good to satisfactory condition with no significant deterioration. The timber piles were typically firm and sound with random minor checking (up to 1/8 inch wide) throughout. At two piles more extensive checking and splitting (up to 1/4 inch wide) was present over the full height. The timber bracing was all firm and sound and adequately connected. There was light to moderate drift throughout the bridge and around all piers, especially across the upstream fascia.

FURTHER ACTION NEEDED: _____ YES ___X___ NO

At this point, timber drift accumulation at the bridge is not excessive; however, it should be monitored, and if found to be progressing to an extent where excessive lateral loads may be exerted on the bridge or scour may be influenced, the drift may need to be removed at that time.

Reinspect the submerged substructure units at the normal maximum recommended interval of five (5) years.

MINNESOTA DEPARTMENT OF TRANSPORTATION
OFFICE OF BRIDGES AND STRUCTURES

UNDERWATER INSPECTION CONDITION RATING FORM

BRIDGE NO. 7003
INSPECTORS Collins Engineers, Inc.
ON-SITE TEAM LEADER Daniel G. Stromberg, P.E. 21491
WATERWAY CROSSED The Big Fork River

INSPECTION DATE August 23, 2002

NOTE: USE ALL APPLICABLE CONDITION DEFINITIONS AS DEFINED IN THE MINNESOTA RECORDING AND CODING GUIDE INCLUDING GENERAL, SUBSTRUCTURE, CHANNEL AND PROTECTION, AND CULVERTS AND WALL DEFINITIONS TO COMPLETE THIS FORM.

CONDITION RATING

			SUBSTRUCTURE						CHANNEL					GENERAL					
UNIT REFERENCE NO.		MAXIMUM DEPTH OF WATER	PILING	COLUMNS, SHAFTS, OR FACES*	FOOTINGS	DISPLACEMENT	OTHER (BRACING)	OVERALL SUBSTRUCTURE CONDITION CODE*	SCOUR	EMBANKMENT EROSION	EMBANKMENT PROTECTION	OTHER (DRIFT/DEBRIS)	OVERALL CHANNEL & PROTECTION CONDITION	CONCRETE	STEEL	TIMBER	LOSS OF SECTION	PREVIOUS REPAIR OR MAINTENANCE	OTHER
	UNIT DESCRIPTION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
	Pier 1	1.5’	7	N	N	9	7	7	8	N	N	7	7	N	N	7	7	N	N
	Pier 2	3.5’	7	N	N	9	7	7	7	N	N	7	7	N	N	7	7	N	N
	Pier 3	7.0’	7	N	N	9	7	7	8	N	N	7	7	N	N	7	7	N	N
	Pier 4	7.5’	6	N	N	9	7	6	8	N	N	7	7	N	N	6	7	N	N
	Pier 5	6.0’	6	N	N	9	7	6	8	N	N	6	6	N	N	6	7	N	N

*UNDERWATER PORTION ONLY

REMARKS: Overall, the submerged timber of Piers 1 through 5 was in good to satisfactory condition with no significant deterioration. The timber piles were typically firm and sound with random minor checking (up to 1/8 inch wide) throughout. At two piles more extensive checking and splitting (up to 1/4 inch wide) was present over the full height. The timber bracing was all firm and sound and adequately connected. There was light to moderate drift throughout the bridge and around all piers, especially across the upstream fascia.

NOTES: ATTACH SKETCHES AS NEEDED, IDENTIFY REMARK BY REFERRING TO UNIT REFERENCE NO. AND REMARK NO.
USE GENERAL SECTION TO IDENTIFY OVERALL PRESENCE OF SPALLS, CRACKS, CORROSION, ETC.